

DEPARTMENT OF THE ARMY TECHNICAL MANUAL
DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

POWER TRAIN, BODY, AND FRAME
FOR ¼-TON 4 x 4 UTILITY TRUCK M38A1 AND
¼-TON 4 x 4 FRONT LINE AMBULANCE M170

TM 9-8015-2	}	DEPARTMENTS OF THE ARMY
TO 36Y23-3-12		AND THE AIR FORCE
CHANGES No. 2		WASHINGTON 25, D. C., 15 April 1955

TM 9-8015-2/TO 19-75CAJ-5, 2 August 1954, is changed as follows:

44. Remove Batteries
(fig. 13)

Caution: Exercise extreme caution * * * the 24-volt system.

* * * * *

e. Remove four front holddown frame nuts (J). Lift the two holddown frames (E) from batteries. Remove the two batteries (K).

Caution: (Added): Do not use a lifting strap which fastens to battery posts as damage to battery will result.

* * * * *

48. Remove Body From Frame M38A1

a. *Make Disconnects at Right Side of Engine* (fig. 17).

* * * * *

(2) (Superseded) *Disconnect distributor to ignition switch cable.* Unscrew electrical cable coupling nut (H) at distributor with coil assembly (G) and disconnect cable to ignition switch (circuit number 12) from distributor with coil assembly.

* * * * *

(4) (Superseded) *Disconnect generator regulator cable.* Unscrew small cable connector coupling nut (M) at front

AGO 4637B—Apr

of generator regulator assembly. Disconnect the cable connection. Pull wiring harness (N) free of open clip (P). Disconnect cable at generator and remove cable.

* * * * *

b. Make Disconnects at Left Side of Engine.

* * * * *

- (4) *Disconnect master brake cylinder vent line* (fig. 18). Disconnect master brake cylinder vent line (L). Remove lockwasher screw (M) and pull master brake cylinder vent line-to-dash clip (N) away from dash panel. Remove vent line.

* * * * *

c. Make Disconnects Inside of Driver's Compartment.

* * * * *

- (11) *Remove steering wheel.* Remove rubber horn button cap from steering wheel nut. Remove horn disk button. Remove steering wheel nut and remove steering wheel with suitable puller.

* * * * *

49. Remove Generator Regulator Assembly M38A1 and Support Plate (fig. 27)

Remove four lockwashers screws (A). Remove generator regulator assembly (B) and mounting bracket from support. Remove one lockwasher screw and remove support plate.

50. Remove Muffler, Exhaust Pipe, and Exhaust Pipe Extension (fig. 28)

* * * * *

c. (Added) Remove Exhaust Pipe. Remove two bolts securing exhaust pipe to manifold. Remove exhaust pipe and gasket. Discard gasket.

64. Install Master Cylinder, Brake Lines, Control Lever, Brake Pedal, and Clutch Pedal

a. Install Master Cylinder Assembly and Brake Lines.

Note. The key letters noted in parentheses are in figure 38, except where otherwise indicated.

* * * * *

- (2) *Install rear tee to rear wheel lines and rear axle tee to master cylinder flexible line.* Install closed clip (Z) on the rear tee to right rear wheel cylinder line (Y). Con-

nect the rear tee to right rear wheel cylinder line (Y), to the rear axle tee (X), and to right wheel cylinder. Secure closed clip (Z) to axle with one $\frac{5}{16}$ -18NC-2 x $\frac{3}{4}$ lockwasher bolt (AA). Connect the rear tee to left rear wheel cylinder line (W), to rear axle tee (X), and to left rear wheel cylinder. Secure rear tee * * * rear axle tee (X).

- * * * * *
- (9) *Install master cylinder assembly.* Position master cylinder assembly (D), shield assembly (E), and master cylinder tie bar (B) on frame left side rail. Install, but do not tighten, two $\frac{3}{8}$ -24NF x 3 tie bar bolts and $\frac{3}{8}$ -inch lockwashers (G). Install the $\frac{1}{4}$ -20NF brake pedal master cylinder eyebolt (A). Connect brake lines (A and J, fig. 37) at outlet fitting (K, fig. 37).

Note. Servicing of brake system is covered in paragraph 79b.

* * * * *

70. Install Muffler, Exhaust Pipe, and Exhaust Pipe Extension (fig. 28)

a. Install Exhaust Pipe Extension. Place new exhaust * * * plain nut (J). Insert new flange gasket at manifold end of exhaust pipe, and secure with one bolt and two nuts for stud and bolt.

* * * * *

71. Install Generator Regulator Assembly and Support Plate M38A1 (fig. 27)

Install support plate with one lockwasher screw. Secure mounting bracket and generator regulator assembly (B) to support with four $\frac{1}{4}$ -28NF-2A x $\frac{3}{4}$ lockwasher screws (A).

72. Install Body on Frame

* * * * *

b. Install Body Mounting Cushions and Mounting Bracket Shims M38A1 (fig. 26). Cement new thin body mounting cushion at number 2 holddown brackets, number 4 holddown brackets, number 5 holddown brackets, and at number 6 holddown brackets. Cement new thick * * * holddown brackets.

* * * * *

d. Connect Body to Frame M38A1. Refer to figure 22 for general location of body holddown brackets and other connect points at bottom of body. Figures 23 and 24 illustrate the points in detail.

- (4) *Make connections at bottom of body (fig. 24).* Install the hand brake rod (P) through hole in body and secure it to the hand brake operating lever with $\frac{5}{16}$ -inch clevis pin (M) and $\frac{1}{8} \times \frac{3}{4}$ cotter pin (Q). **Install retracting spring (N).** Connect fuel tank-to-air cleaner vent line (R) to flared tube elbow (U). Connect fuel line (S) to flared tube elbow (T). Secure fuel line by push-on-type clip (V).

Note. Secure skid plate to engine rear support crossmember with four $\frac{3}{8}$ -16NC-2 x $\frac{7}{8}$ square-neck carriage bolts and $\frac{3}{8}$ -16NC-2 lockwasher nuts.

e. Make Connections Inside of Driver's Compartment.

* * * * *

- (8) *Install mounting tube jacket to instrument panel clamp (fig. 21).* Install liner (M). Secure mounting tube jacket to instrument panel clamp (L) with two $\frac{5}{16}$ -24NF-2 x $\frac{7}{8}$ lockwasher bolts and $\frac{5}{16}$ -24NF-2 plain nuts (K). Tighten three bolts securing steering gear to frame side rail.

* * * * *

g. Make Connection at Right Side of Engine (fig. 17).

* * * * *

- (7) (Superseded) *Connect distributor to ignition switch cable.* Connect the ignition switch cable (circuit number 12) to distributor with coil assembly (G). Tighten electrical cable coupling nut (H).

• • • • •

96. Assembly
(fig. 59)

• • • • •

- b. Install Second Speed and First and Reverse Speed Sliding Gear.* Install main shaft • • • against speed gear. Slide synchronizer hub (F), with assembled parts, onto main shaft, install the second and third speed synchronizer hub snap ring (C), and follow with the second blocking ring (A).

102. Install Reverse Idler Shaft Gear
(fig. 45)

* * * * *

- b. Install Countershaft Cluster Gear Oil Collector.* Rescinded.

103. Install Transmission Countershaft Cluster Gear

a. *Install Countershaft Cluster Gear.* Coat the countershaft * * * of transmission case. Slide the rear thrust washer (K) between thrust washer on cluster gear and transmission case.

b. *Check Countershaft Cluster Gear End Play.* The countershaft cluster * * * install cluster gear.

104. Install Input Shaft With Integral Gear

a. (Superseded) *Install Input Shaft With Integral Gear* (fig. 45). Place input shaft with integral gear in position through opening in front of transmission case. Tap input shaft (BB) into case until the snap ring installed in the groove of ball bearing rests against transmission case. Install countershaft cluster gear oil collector (F) so it is engaged in groove of input shaft gear. Be sure that the gear can turn without binding on oil collector. (Loosen oil collector mounting bolts to aid in installation of countershaft cluster gears.) Coat main shaft front bearing rollers (CC) with general purpose grease (GO) to aid in assembly. Install the 14 bearing rollers in the recess at gear end of input shaft (BB).

b. *Secure Countershaft Cluster Gear Oil Collector.* Secure countershaft cluster * * * of 15 pound-feet. Lift cluster gear into position and start the transmission countershaft (MM) into rear of transmission case. Drive countershaft through case and bore of cluster gear, driving out the arbor used for securing bearing rollers (M, P, T, and V), bearing roller spacer (R), and bearing roller spacer washers (L, N, Q, S, U, and W). Drive countershaft in until one-half inch of shaft protrudes from the case. Be sure that all thrust washers are installed and secured by countershaft.

* * * * *

112. Remove Transfer Rear Axle Output Shaft Retainer With Bearing Assembly

* * * * *

b. Remove the speedometer drive gear (fig. 65) and the bearing retainer shims.

115. Remove Transfer Rear Axle Output Shaft

* * * * *

c. (Superseded) Use a suitable remover to remove rear axle output shaft bearing cup (CC, fig. 73) from recess in side of transfer case.

121. Inspection and Repair

(fig. 74)

a. Inspection.

- (3) *Front axle output shaft clutch gear.* Inspect the front axle output shaft clutch gear (LL) for damaged or worn splines or other damage. Replace, if necessary. Place clutch gear on output shaft and **check-backlash**. Clearance between clutch gear and output shaft must not exceed 0.005 inch (par. 271b). If clutch gear does not slide smoothly over output shaft or is not within dimensions, replace either the gear or shaft.

131. Install Transfer Rear Axle Output Shaft Assembly

- c. *Install Rear Axle Output Shaft Driven and Sliding Gears* (fig. 73). Place the rear * * * and driven gears. Slide the rear axle output shaft thrust washer (FF) and snap ring (EE) onto the shaft. Push snap ring into position in groove of shaft with replacer 41-R-2384-540 (fig. 78).

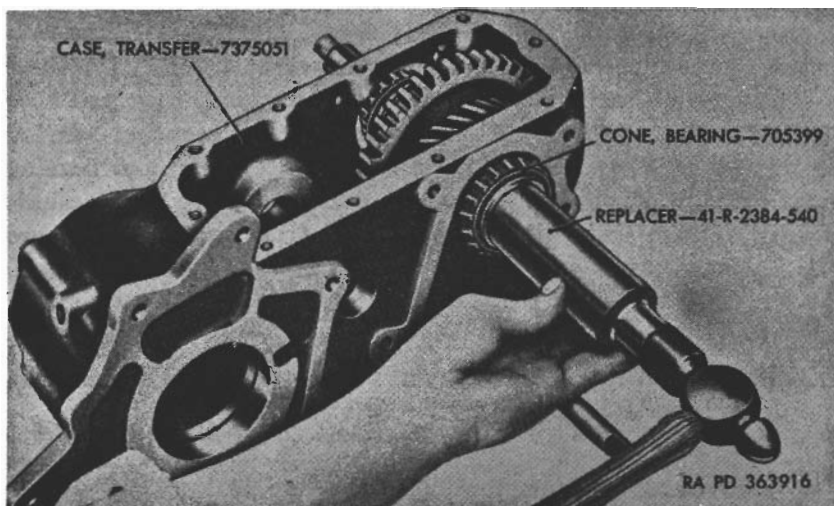


Figure 79. (Superseded) Installing transfer rear axle output shaft inner bearing cone.

140. Description

- b. *Universal Joints.* Both the front * * * (V) figure 88. Except for this difference, the parts of all four universal joints are the same and consist of a journal, bearing assemblies, and snap rings.

145. Description and Operation

e. Rzeppa Universal Joint (fig. 93). The Rzeppa joint consists of a hollow end of an axle shaft which fits over a solid member of the mating axle shaft. The Rzeppa universal joint comprises a ball cage and race in conjunction with six universal joint balls which are held in place by the universal joint inner shaft retainer. The end play * * * of the kingpins.

148. Remove Front Axle Shaft Assembly

c. Remove Spindle With Bearing Assembly (fig. 95). Disconnect brake line from brake cylinder. Remove six bolts * * * with bearing assembly.

149. Remove Front Axle Steering Knuckle Flanges

a. Remove Front Brake Flexible Line Guard. Remove the two * * * flange cap assembly. Remove tie rods from steering knuckle flanges.

152. Disassembly

Note. It is not * * * proceed as follows:

d. Disassemble Axle Shaft With Rzeppa Universal Joint.

(2) *Remove universal joint balls.* Push universal joint * * * universal joint cage. Repeat the above operation until the five remaining universal joint balls are removed.

154. Assembly

b. Assemble Axle Shaft With Rzeppa Universal Joint.

(3) *Install universal joint balls (fig. 105).* Tilt the universal * * * universal joint ball. Repeat the above operation for the remaining four universal joint balls.

158. Disassembly
(fig. 108)

* * * * *

c. *Remove Differential Pinions and Side Gears.* Using a long nose drift, drive the lock pin (AA-9) out of the differential case with brass drift and hammer. **Tap out pinion shaft (AA-10).** Roll the pinions * * * from differential case.

166. Install Steering Knuckle Flange With Arm Assemblies

* * * * *

d. *Install Opposite Steering Knuckle Flange.* Install opposite steering knuckle flange in the same manner as prescribed above. **Install tie rods to steering knuckle flanges.**

167. Install Shaft Assembly

* * * * *

b. *Install Spindle With Bearing Assembly* (fig. 94). Position spindle with * * * and $\frac{3}{8}$ -24NF 3 x $\frac{3}{4}$ bolts (T). **Connect brake line to brake cylinder.**

* * * * *

171. Remove Axle Shafts

* * * * *

b. *Remove Brake Assembly* (fig. 127). Remove hub cap * * * from axle shaft. **Disconnect brake line from brake cylinder.** Remove six bolts * * * of shims removed.

* * * * *

183. Install Axle Shafts
(fig. 127)

* * * * *

c. *Install Brake Assembly.* Install bearing shims * * * of 25 to 35 pound-feet. **Connect brake line to brake cylinder.**

* * * * *

188. Assembly
(fig. 141)

* * * * *

b. Install the anchor end shoe retainer spring (AA) on the front and rear brake shoes. Place the front shoe (C), **having the long lining**, and the rear shoe (Q), **having the short lining**, on the backing plate assembly (T). Install shoes so that their lower ends engage slots behind plate anchor and their upper ends contact wheel cylinders.

* * * * *

190. Disassembly M38A1

d. Disassembly. It is not necessary to disassemble the brake and brake rod assemblies unless inspection (par. 191a) reveals them to be unserviceable.

- (2) *Hand brake assembly* (fig. 144). Drive out the * * * to release lever (J).

Note. (Added) Hand brake levers are furnished as an assembly only. Field repairs will be made from parts generated in the field.

196. Disassembly

a. Springs (figs. 145 and 146). The front and * * * proceed as follows:

- (2) *Remove rebound clips.* Remove rebound clip nut, spacer, and bolt securing each of the two outer and two intermediate rebound clips on the M38A1 and four rebound clips on the M170. Pry off the clinched ends of the two inner rebound clips. Remove the spring leaves.

197. Inspection and Repair

a. Inspection.

- (1) *Spring leaves.* Inspect all spring leaves for cracks and and breaks. A faulty spring leaf must be replaced. Replace rebound clips if they are broken, cracked, or otherwise damaged. Check to see if the bolt, spacer, and nut from inner (long) rebound clips of both front springs have been removed and discarded and the ends of the clips bent inward to clinch over the top of the No. 1 spring leaf.

198. Assembly

a. Springs (figs. 145 and 146). Assembly operations for front and rear springs are similar.

- (2) *Secure rebound clips.* Secure each of the two outer and two intermediate rebound clips on the M38A1 or four rebound clips on the M170 with a rebound clip spacer,

$\frac{5}{16}$ -24NF-2 x 2 $\frac{1}{2}$ bolt, and nut. Peen ends of rebound clip bolts. Secure each of the two inner rebound clips by bending both ends of the clip inward, to clinch over the top of the No. 1 spring leaf.

Note. (Added) The clip spacer, bolt, and nut are not installed on the two inner rebound clips.

* * * * *

202. Disassembly (fig. 150)

* * * * *

d. Remove Pitman Arm. Unscrew the nut (A) from pitman shaft with integral cam (JJ) and remove lockwasher (B). Pull pitman arm (C) from end of pitman shaft. It may be necessary to use a suitable puller to free it from serrations on pitman shaft. Check pitman shaft for burrs and raised metal or nicks. Smooth as necessary. Rough surface on pitman shaft can damage pitman shaft bearings during removal of shaft from housing. Pull shaft (JJ) from housing.

Note. Once the worm bearing snap rings are removed, the balls will readily fall out of cups unless pressure is exerted.

* * * * *

221. Body

* * * * *

b. Inspection and Repair.

- (1) *Inspection.* Inspect body for * * * or bent condition. Inspect glove compartment door striker. Position vertical striker so that latch of door lock will contact center of striker plate. Tighten retainer screw. Adjust striker to hold door securely, bending striker in or out to obtain proper latch position.

* * * * *

222. Windshield Assembly

a. Disassembly. It is not necessary to disassemble the windshield assembly unless inspection reveals unserviceable parts.

* * * * *

(10) *Disassemble windshield wiper motor* (fig. 168).

Note. Do not disassemble windshield wiper motor unless it is faulty. Remove handle set * * * from paddle assembly.

Note. (Added) Windshield wiper motors are replaced as a unit unless repair kits are available.

* * * * *

224. Fuel Tank Assembly (fig. 172)

a. *Disassembly.* It is not necessary to disassemble fuel tank unless inspection (b below) reveals damage. Refer to TM 9-804A for removal of fuel tank from body on the M38A1 or paragraph 220.3 on the M170.

* * * * *

- (3) *Disassemble fuel filter assembly.* Remove nut (K), lock-washer (L), and screw (P). Remove screw (H), washer (G), and nut (F), which secure cover plate bracket around the fuel filter element (M). Remove end plate
• • • plate assembly (E).

* * * * *

238. Disassembly (fig. 177)

a. *Remove Radiator Assembly From Power Plant.* Remove the radiator filler neck cap (D) and gasket (E) and open drain cock (P) to drain cooling system. Provide suitable container if anti-freeze has been installed. Disconnect radiator hose • • • support rods (S and V).

* * * * *

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For explanation of abbreviations used see SR 320-50-1.